What is claimed is:

1. A method of forming poly-silicon crystallization, comprising the steps of:

forming an amorphous silicon layer on a substrate;

forming a protective layer on the amorphous silicon layer;

forming a reflective layer on the protective layer;

patterning the protective layer and the reflective layer simultaneously to form an opening exposing a portion of the amorphous silicon layer; and

laser annealing the amorphous silicon layer to form nucleation sites in the amorphous silicon layer under the protective layer and the reflective layer, wherein crystallization then grows towards the amorphous silicon layer in the opening to form a poly-silicon layer having a grain size of a micrometer with high grain order.

2. The method of claim 1, wherein the step of forming the amorphous silicon layer comprises plasma enhanced chemical vapor deposition (PECVD).

3. The method of claim 1, wherein the protective layer is a non-metal material with resistance to metal diffusion.

4. The method of claim 3, wherein the non-metal material comprises silicon oxide.

5. The method of claim 1, wherein the reflective layer is a metal material with reflectivity to lasers for stopping laser energy of the step of laser annealing from transferring to the amorphous silicon layer covered with the reflective layer.

6. The method of claim 5, wherein the metal material comprises moly-tungsten (MoW).

7. The method of claim 1, wherein the step of laser annealing comprises using a XeCl excimer laser light source.

8. The method of claim 1, wherein the step of laser annealing comprises laser energy of about 330-450 mJ/cm^2.

9. The method of claim 1, further comprising the steps of:

removing the reflective layer and the protective layer to expose entirely the poly-silicon layer; and

performing another laser annealing to re-crystallize the poly-silicon layer, wherein the poly-silicon layer is crystallized more completely and a poly-silicon layer with a smooth surface is also obtained.

10. A method of forming poly-silicon crystallization, comprising the steps of:

forming an amorphous silicon layer on a substrate;

forming a protective layer on the amorphous silicon layer;

forming a reflective layer on the protective layer;

patterning the protective layer and the reflective layer simultaneously to form an opening exposing a portion of the amorphous silicon layer; and

performing a first laser annealing to form nucleation sites in the amorphous silicon layer under the protective layer and the reflective layer, wherein crystallization

then grows towards the amorphous silicon layer in the opening to form a poly-silicon layer;

removing the reflective layer and the protective layer to expose entirely the poly-silicon layer; and

performing a second laser annealing to re-crystallize the poly-silicon layer, wherein the poly-silicon layer is crystallized more completely and smoothed, and finally a poly-silicon layer having a grain size of a micrometer with high grain order and a smooth surface is formed.

11. The method of claim 10, wherein the protective layer comprises a silicon oxide layer.

12. The method of claim 10, wherein the reflective layer is a metal material with reflectivity to lasers for stopping laser energy of the first step laser annealing from transferring to the amorphous silicon layer covered with the reflective layer.

13. The method of claim 12, wherein the metal material comprises moly-tungsten (MoW).

14. The method of claim 10, wherein the first laser annealing and the second laser annealing comprise using a XeCl excimer laser light source.

15. The method of claim 10, wherein the first laser annealing comprises laser energy of about 330-450 mJ/cm^2.

16. The method of claim 10, wherein the second laser annealing comprises lower laser energy than that of the first laser annealing.

17. The method of claim 10, wherein the step of removing the protective layer and the reflective layer is wet etching.

18. A method of fabricating a poly-Si TFT, comprising the steps of:

forming an amorphous silicon layer on a substrate;

dehydrogenating the amorphous silicon layer;

ion implanting the amorphous silicon layer to form source/drain regions of the amorphous silicon layer;

forming a dielectric interlayer on the amorphous silicon layer;

patterning the dielectric interlayer to form contact holes exposing the source/drain regions of the amorphous silicon layer;

forming a source/drain metal on the dielectric interlayer and in the contact holes;

patterning the source/drain metal and the dielectric interlayer simultaneously to form a opening exposing a portion of the amorphous silicon layer;

laser annealing the amorphous silicon layer to form nucleation sites in the amorphous silicon layer covered with the source/drain metal, wherein crystallization then grows towards the amorphous silicon layer in the opening to form a poly-silicon layer;

forming a gate-insulating layer; and

forming a gate metal on the gate-insulating layer.

19. The method of claim 18, wherein the source/drain metal has reflectivity to

lasers for stopping laser energy of the step of laser annealing from transferring to the amorphous silicon layer covered with the source/drain metal.